CLAIMS

1. A process for motion estimation in video signals organized in successive frames divided into macroblocks, the process comprising: a first identification phase in which, starting from a current motion vector, a best motion vector predictor is identified within a set of candidates, and a second phase of refining the best motion vector predictor thus identified; the set of candidates formed from vectors belonging to macroblocks association with the current vector within the current frame and the preceding frame.

2. The process of claim 1, wherein the set includes, in the preceding frame, the vector homologous to the said current motion vector.

3. The process of claim 1, compromising the operation of scanning the macroblocks in lexicographic order within each frame, as a result of which the set includes, within the current frame, vectors belonging to macroblocks located above and to the left of the current macroblock.

4. The process of claim 1, wherein the set includes vectors belonging to at least one of the macroblocks chosen from the group consisting of:

in the current frame, macroblocks located to the left of and above the current macroblock, and

in the preceding frame, the homologous macroblock and the macroblocks located to the left of the current macroblock.

5. The process of claim 1, wherein the best predictor is identified, within the set, as the predictor that minimizes a residual error measurement function.

6. The process of claim 5, wherein the function is the SAD function.

7. The process of claim 5, wherein the function is the SSD function.

8. The process of claim 1, wherein the refining phase comprises the operation of forming a grid of n points centered on the central position to which a best mode vector points, the distance of the points of the grid from the center being defined as a linear function of a matching error defined in the first identification phase.

9. The process of claim 8, wherein the distance is defined as the product of a coefficient and the error function.

10. The process of claim 8, wherein the error function is the SAD function.

11. The process of claim 8, comprising the operation of selecting as the motion vector for the current macroblock, within the said grid, the motion vector that minimizes a further residual error function.

12. The process of claim 11, wherein the further residual error function is the SAD function.

13. The process of claim 8, comprising the operation of selectively amplifying the grid by a given amplification factor.

14. The process of claim 13, comprising the operation of monitoring the quality of the predictor as a function of a given error function, and wherein the grid is amplified when the predictor has an error function greater than the given value.

15. The process of claim 14, wherein the grid amplification factor is calculated as a function of the analysis of the distribution of the error function for some sample sequences.

16. The process of claim 1, applied to the IPB operating mode of the H.263+ video standard for the processing of pairs of PB frames, comprising the operation of selecting the temporal predictors of the B frame of a BP pair before the temporal predictors of the P frame of the BP pair.

17. The process of claim 1, applied to the APM operating mode of the H.263+ video standard, in which the frame of a macroblock is associated with a plurality of vectors, preferably four in number, associated with a corresponding plurality of further blocks constituting the macroblock to which the previously found motion vector points, in which the first identification phase is applied to the macroblock, while the second phase is applied to the blocks of the plurality to identify the plurality of vectors.

18. A system for motion estimation in video signals organized in successive frames divided into macroblocks by means of the identification of motion vectors, the system comprising: a motion estimation block configured to implement a first identification phase in which, starting from a current motion vector, a best motion vector predictor is identified within a set of candidates, and a second phase of refining the best predictor thus identified; the said set of candidates being formed from vectors belonging to macroblocks close to the current vector within the current frame and the preceding frame.

19. The system of claim 18, wherein the estimation block is configured to include in the set in the preceding frame the vector homologous to the current motion vector.

20. The system of claim 18, wherein the motion estimation block is configured to scan the macroblocks in lexicographic order within each

frame, as a result of which the set includes, within the current frame, vectors belonging to macroblocks located above and to the left of the current macroblock.

21. The system of claim 18, wherein the estimation block includes in the set vectors belonging to at least one of the macroblocks chosen from the group comprising:

in the current frame, macroblocks located to the left of and above the current macroblock, and

in the preceding frame, the homologous macroblock and the macroblocks located to the left of the current macroblock.

22. The system of claim 18, wherein the estimation block selects the best predictor, within the set, as the predictor that minimizes a residual error measurement function.

23. The system of claim 22, wherein the function is the SAD function.

24. The system of claim 22, wherein the function is the SSD function.

25. The system of claim 18, wherein the estimation block is configured to implement the refining phase by forming a grid of n points centered on the central position to which the best mode vector points, the distance of the points of the grid from the center defined as the function, preferably linear, of the matching error defined in the first identification phase.

26. The system of claim 25, wherein the distance is defined as the product of a coefficient and the error function.

27. The system of claim 25, wherein the error function is the SAD function.

28. The system of claim 25, wherein the estimation block selects, as the motion vector for the current macroblock, within the grid, the vector that minimizes a further residual error function.

29. The system of claim 11, wherein the further residual error function is the SAD function.

30. The system of claim 18, wherein the estimation block is capable of selectively amplifying the grid by a given amplification factor.

31. The system according to claim 30, wherein the estimation block monitors the quality of the predictor as a function of a given error function, and amplifies the grid when the predictor has an error function greater than the given value.

32. The system of claim 30, wherein the estimation block calculates the grid amplification factor as a function of the analysis of the distribution of the error function for some sample sequences.

33. The system of claim 18, configured to operate according to the IPB operating mode of the H.263+ video standard for the processing of pairs of PB frames, in which the estimation block selects the temporal predictors of the B frame of a BP pair before the temporal predictors of the P frame of the BP pair.

34. The system of claim 18, configured to operate according to the APM operating mode of the H.263+ video standard, in which the estimation block associates the frame of a macroblock with a plurality of vectors, preferably four in number, associated with a corresponding plurality of further blocks constituting the macroblock to which the previously found motion vector points, in which the estimation block applies, respectively,

the first identification phase to the macroblock, and

the second phase to the blocks of the plurality to identify the plurality of vectors.

35. A motion estimation process, comprising:

identifying a best motion vector predictor as the predictor that minimizes a residual error measurement function within a set of candidates formed from vectors belonging to at least one macroblock chosen from a group of macroblocks in the current frame of macroblocks located to the left of and above the current macroblock, and in the preceding frame the homologous macroblock and the macroblocks located to the left of the current macroblock; and

refining the best motion vector predictor so identified, comprising the operation of forming a grid of n points centered on a central position to which a best mode vector points, including defining the distance of the best mode vector pointing to the center as a linear function of a matching error previously defined in identifying the best motion vector predictor.

36. The process of claim 35, wherein the residual error measurement function comprises a SAD (sum of absolute differences) function.

37. The process of claim 35, wherein the residual error measurement function comprises a SSD (sum of squared differences) function.

38. The process of claim 35, wherein the distance is defined as a product of a coefficient of the residual error measurement function.